Rocky Flats Citizens Advisory Board

Our Legacy Report to the Community

June 2006

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Mission Statement

The Rocky Flats Citizens Advisory Board, a nonpartisan, broadly representative, independent advisory board with concerns related to Rocky Flats activities, is dedicated to providing informed recommendations and advice to the agencies (Department of Energy, Colorado Department of Public Health and Environment, and the Environmental Protection Agency), government entities, and other interested parties on policy and technical issues and decisions related to cleanup, waste management, and associated activities. The Board is dedicated to public involvement, awareness, and education on Rocky Flats issues.

Principal author of this report was Ken Korkia, Executive Director of the Board.

Graphics and layout design were provided by Deborah French.

Photographs were provided courtesy of the U.S. Department of Energy.

The deer photograph on page 13 was provided by Board member Bill Kossack.

I. Introduction

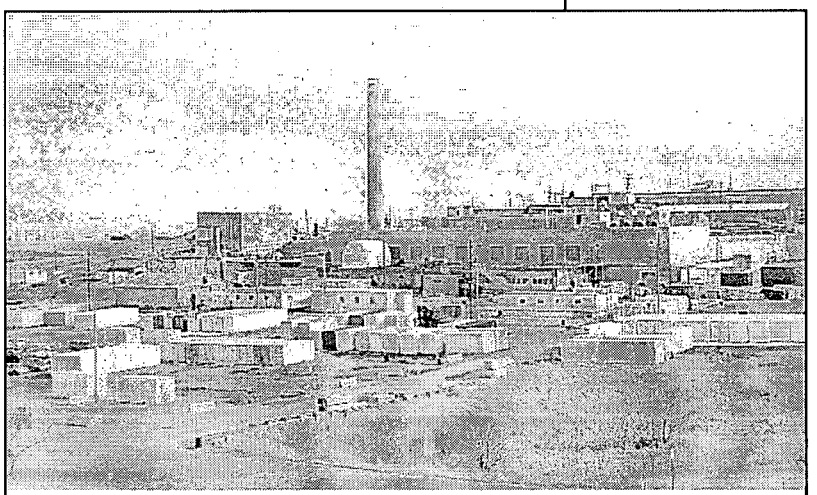
Legacy: Webster defines this word as "something resulting from and left behind by an action, event, or person." On the following pages you will read about different legacies. There is the legacy of a former nuclear weapons manufacturing facility and the monumental effort to clean up decades worth of environmental contamination. Within that cleanup effort, there is another legacy. It is the legacy of a group of citizens who volunteered their time and energy to make certain that the cleanup effort would be protective of human health and the environment, not just for themselves and their neighbors, but for future generations as well. This is the legacy of the Rocky Flats Citizens Advisory Board.

Involving citizen stakeholders in the cleanup of Rocky Flats was truly a unique experiment by the federal government. After decades of secrecy, the operational culture at Rocky Flats was not immediately conducive to public scrutiny and openness as the cleanup program began. The overwhelming technical aspects of the cleanup, especially those dealing with nuclear materials, also presented a major challenge for citizen participation.

In late 2005, the physical cleanup of Rocky Flats was complete. How did this accomplishment happen? What were the contributions of local citizens? What are the implications for the future? These are the legacies that will be described in this report.

II. A Brief History of Rocky Flats

Rocky Flats began operating in 1953 as a manufacturing facility for the plutonium core that was part of the nuclear warheads produced in this country during the Cold War. Shrouded in secrecy, the site operated in relative obscurity until a major industrial fire occurred in 1969. The result of this fire was increased scrutiny and concern by the public. These concerns, heightened by anti-nuclear sentiments, brought numerous protests to the gates of Rocky Flats over the next twenty years.

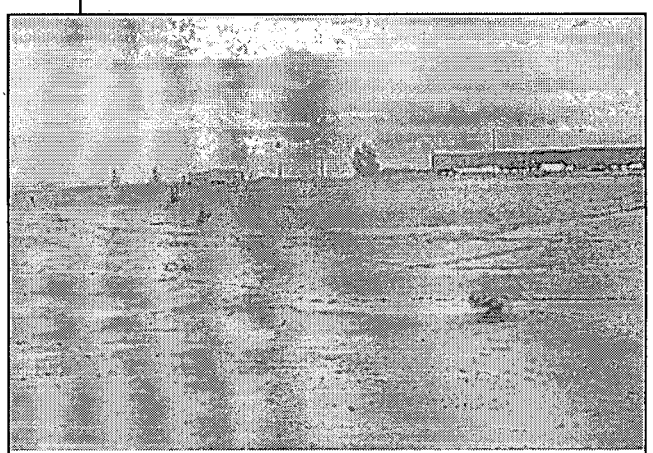


A major cleanup challenge, Building 771 was once called the "Most Dangerous Building in America."

1989 was a pivotal year in Rocky Flats' history. That year first saw the site placed on the National Priorities List for Superfund. Later that year, the Federal Bureau of Investigation (FBI) and the Environmental Protection Agency (EPA) staged an unprecedented raid at the site to investigate allegations of environmental crimes. The year closed with an announcement that site operations were "temporarily" suspended so that health and safety issues could be addressed.

Rocky Flats was a facility in trouble. Things had to change. First, a new contractor was hired to manage the site. In addition, hundreds of new Department of Energy (DOE) employees were brought in to oversee the contractor. Because of its place on the Superfund list, the site also saw increased oversight by state and federal regulators. In addition, Superfund initiated a more formal public involvement process for the surrounding community.

During the next couple of years, there were two major activities at the site. The first and predominant focus was to upgrade facilities and write new procedures so that nuclear weapons production could restart. A secondary focus was to begin addressing the environmental issues responsible for the site's listing on Superfund. The environmental activities were mainly studies to identify areas of contamination, followed by development of plans to address what was found.



This photo was taken after the demolition of Building 771 was complete.

Numerous public meetings were held during this time to address both the restart and the cleanup issues.

Many of these meetings were formal public hearings, with very little opportunity for dialogue between site officials and the public. Other more open meetings were highly volatile. Tensions were high because thousands of jobs were on the line. At many of the meetings obvious factions were represented. On one side of the room were workers and economic development interests defending site operations and the need to restart weapons production. On the other side were environmentalists and anti-nuclear activists who did not want to see operations begin anew for fear that additional environmental contamination might result.

The restart issue was settled in 1992, when President George H. W. Bush announced that the remaining nuclear weapons program slated for Rocky Flats was cancelled. Thus, the nuclear weapons mission at Rocky Flats ended and the sole focus on cleanup and closure of the site began.

A major negative consequence of the "temporary" shutdown in 1989 that ultimately became permanent in 1992 was that nuclear materials were suspended in various intermediary stages of production. Like any large factory, raw materials were brought in one end, various processing steps then occurred, and a finished product came out the other end. Unfortunately for Rocky Flats, the longer-than-normal storage of nuclear materials in the various stages of throughput resulted in very dangerous conditions. Most notable were plutonium-bearing solutions stored in tanks and pipes not designed for extended storage. The threat of leaks and spills was high.

As for the environmental cleanup mandated by Superfund, things were not going well either. Although progress was being made to identify areas of contami-

nation, not much actual work to remove or treat the contamination had been done. Federal budget cutbacks also threatened milestones in the cleanup agreement negotiated between the Department of Energy (DOE), the State of Colorado and the Environmental Protection Agency (EPA).

It is in this context that the Rocky Flats Citizens Advisory Board came into existence in 1993.

III. The Creation of the Rocky Flats Citizens Advisory Board

In the early 1990s, a group called the Federal Facilities Environmental Restoration Dialogue Committee was formed. This committee was nicknamed the Keystone Group after the company hired to facilitate its meetings. The members were charged with developing a means to prioritize the many cleanup projects affecting contaminated federal facilities across the country, most of them either Department of Defense or Department of Energy sites. Committee members represented federal, state and local governments; national and local environmental organizations; and affected citizens. Early in 1993, the Keystone Group issued a draft report that included a recommendation to develop local advisory boards at each of the contaminated federal sites. Funding and support for the local boards would be provided by the government agency responsible for the site in question.

Members of the Rocky Flats community were quick to act on this recommendation and convened a dialogue of interested community members and government agency representatives. These open discussions resulted in the development of a process to establish a local advisory board to focus on Rocky Flats. Representatives from the Colorado Department of Public Health and Environment and the Environmental Protection Agency were tasked with managing the initial membership selection process.

The first step was to widely advertise that an advisory board was being formed and that membership applications were being accepted. Over two hundred individuals submitted applications. The health

Board Outreach

As declared in its mission statement, the Board was dedicated to public involvement, awareness, and education on Rocky Flats issues. To that end, the Board used a variety of outreach tools. Most visible was a dedicated website where information about the Board was posted. Included on the website was background information about the Board and Rocky Flats. Also posted were meeting agendas and minutes as well as a copy of all the Board's recommendations, newsletters and reports.

For most of its operation, the Board produced a quarterly newsletter, called The Advisor. The newsletter provided highlights about the Board and its activities as well as giving a running update and commentary on the progress of the Rocky Flats cleanup. This communication tool was geared toward the non-technical reader and was sent to more than 3,000 members of the surrounding community.

To personally extend its outreach into the community, the Board formed a speaker's bureau that gave numerous presentations to community groups and to students ranging from middle school to college. The presentations often included a slideshow created by the Board.

The Board also had open participation in its various committees and working groups formed over the years. Anyone in the community could participate with equal standing. For the most part, work on drafting recommendations was done in these committees, with final approval coming during the monthly Board meetings. At monthly Board meetings, a public comment period was always scheduled to allow anyone to address the Board on whatever topics they desired.

department and EPA representatives selected an initial group of six individuals representing a broad cross-section of the community including local governments, community groups and site workers. These six individuals then reviewed the remaining applications and selected twenty-four others to join them. The top priority in selecting these members was to ensure as diverse a Board as possible.

Cleanup of the 903 Pad was done inside a large tent structure.

Another important consideration in the Board's organization was that there would be no officially designated membership seats. For example, while the Board had members who were affiliated with groups such as the United Steelworkers of America and the Sierra Club, there were no official seats guaranteed for these organizations to be filled in perpetuity. Instead, the members were selected and assigned to membership categories such as academia, technical, local government, environmental and community groups, business, health professions, and site workers. In this manner, the Board hoped to balance the interests and expertise found within the community as a whole.

An additional membership feature was the inclusion of *ex officio* representatives from the Department of Energy, the Colorado Department of Public Health and Environment, and the Environmental Protection Agency (and later the U.S. Fish and Wildlife Service). These *ex officio* representatives participated in all the discussions, but were not eligible to vote on specific proposals or recommendations.

The first full meeting of the Rocky Flats Citizens Advisory Board was held on November 8, 1993. Around the table for that first meeting were individuals who in the past had often been at odds with each other on issues such as the restart of Rocky Flats. Now they were seated around a common table with the task of working together on the cleanup of the site.

For the first months of operation, the Board was busy with administrative and organizational tasks. The members developed and approved bylaws, a budget, a staffing plan, and a mission statement. One of the key decisions was to organize the Board as a non-profit corporation in order to maintain its independence from the Department of Energy. The members also agreed to use a consensus decision-making process in developing and approving its recommendations related to the cleanup of the site. Given the diversity of its membership, the Board felt that any recommendations approved by consensus would likely have more impact with the Department of Energy and the regulatory agencies.

With the rapid pace in which the Rocky Flats community developed a local advisory board following the release of the Keystone Group's recommendations, the Department of Energy still needed to determine how it would organize a national framework for advisory boards at all of its nuclear weapons facilities. Eventually, it decided to create a single national entity, the Environmental Management Site Specific Advisory Board (EM SSAB) as a federal advisory committee. In total, eleven local boards at sites

such as Rocky Flats, Savannah River in South Carolina, and Hanford in Washington would be formed and joined together as part of the EM SSAB. Each local board would maintain its unique identity and work on its site-specific issues, but together the eleven would be united under a single national charter. The Rocky Flats board remained unique among its peers in that it was the only one to organize as a separate non-profit corporation. Thus, the individuals at Rocky Flats were members of both a non-profit corporation and a federal advisory committee.

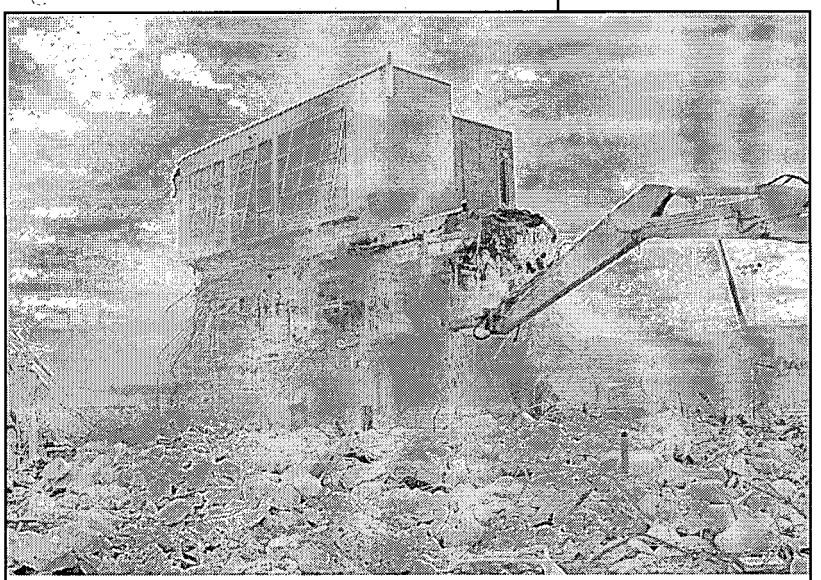
IV. The Cleanup Challenge at Rocky Flats

Once it was organized and had hired its own staff, the Board was ready to start work learning about and addressing the cleanup needs at the site. As described below, there was much to do and the challenges were great.

The biggest challenge centered on the storage of nuclear wastes and materials at the site. As stated earlier, the "temporary" shutdown had left plutonium solutions stored in tanks and pipes that needed to be drained and stabilized. Rocky Flats also hosted over fourteen tons of weapons grade plutonium that needed to be consolidated, repackaged and shipped to some other location. In addition, there was a large quantity of plutonium residues and other forms of nuclear waste. Many of these waste materials also required stabilization and repackaging. In 1994, there were no receiver sites identified for most of these materials, so development of more robust onsite storage facilities was being discussed. Keeping the materials onsite, however, would mean delays in achieving a complete and timely closure.

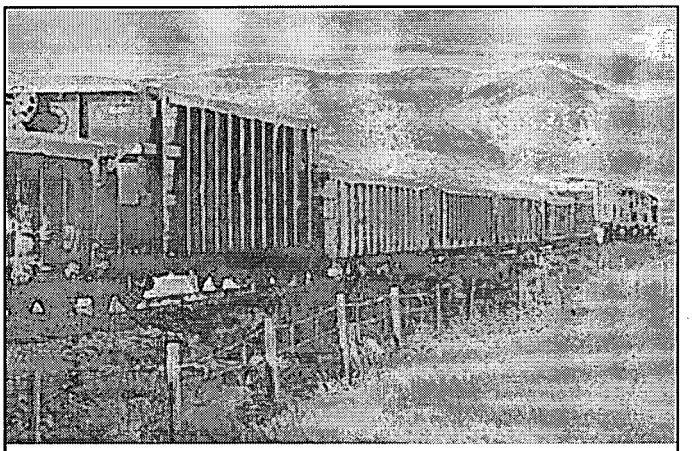
The Department of Energy's own assessment of the dangers associated with the continued onsite storage of these plutonium materials in their current conditions was highly alarming. In a nationwide ranking of the most dangerous facilities storing plutonium, four of the top ten were at Rocky Flats. One of the Rocky Flats facilities, Building 771, even was dubbed by the ABC program *Nightline* as being "the most dangerous building in America."

Another cleanup challenge would be the decontamination and demolition of more than 800 buildings and structures at Rocky Flats. Within many of the buildings were miles of pipes and ventilation systems, hundreds of gloveboxes, and very large and heavy pieces of equipment. Much of the infrastructure within the buildings, as well as the very walls, floors and ceilings, was contaminated with plutonium, uranium, beryllium, and a host of chemicals. Little was known whether



The last of the former plutonium facilities to be demolished was Building 371. The photo shows the final stages of demolition in 2005.

any contamination had escaped beneath the foundations of these buildings, many of them built up to forty feet below the surface. There were also miles of underground piping that transferred liquid materials between various buildings. Many of these lines were known or suspected to have leaked.



This is the final rail shipment of low level nuclear waste that left the site in the fall of 2005.

The environmental contamination at the site also presented challenges. Although most of the nuclear waste generated during weapons production was shipped to Idaho as it was produced, there were still burial trenches at the site containing organic solvents, reactive metals, and depleted uranium. Two onsite waste facilities for mainly sanitary wastes, but also some hazardous materials, were operated during the site's history; one was nothing more than a dump, the other an engineered landfill. Both would require more thorough characterization and some type of closure.

The most infamous environmental site was the 903 Pad where waste drums containing a mixture of machining oil, organic solvents, and plutonium metal shavings were stored. Materials from these drums eventually leaked into the adjacent soil. An earlier remediation project had removed the drums and scooped up the contaminated soil. Unfortunately, strong winds arose during the process of removing the contaminated soil, causing it to spread to both on and offsite areas. In the early 1970s, an asphalt cap was installed over the main drum storage area. Final cleanup of this site would require removing the asphalt and underlying soil as well as any contaminated soil spread to adjacent areas.

A final cleanup challenge would be groundwater contamination. Although groundwater at Rocky Flats is not used for drinking or irrigation purposes, the unique hydrogeology of the site causes groundwater to daylight into surface water streams and flow offsite. Thus, groundwater contamination needed to be addressed so as to not affect surface water. The major groundwater contaminants included organic solvents, uranium and nitrates.

V. Major Cleanup Issues Addressed by the Board

Since 1993, members of the Rocky Flats Citizens Advisory Board have reviewed thousands of pages of documents and heard hundreds of presentations on cleanup plans and proposals. They deciphered federal budget documents, became familiar with computer modeling codes, studied radiation health physics, and learned a whole new language of acronyms. Through these efforts, the Board produced a total of 117 consensus recommendations covering a wide array of topics and issues. Because it is

not possible to adequately describe each and every one of these recommendations within these pages, the following sections highlight some of the more significant areas of contribution. These areas are also highlighted because they reflect important steps in the cleanup and closure process at Rocky Flats.

Developing a Regulatory Framework for Cleanup

At the time the Board held its first meeting in 1993, negotiations between the Department of Energy, the state of Colorado, and the Environmental Protection Agency had just gotten underway to revise the regulatory agreement governing the cleanup of the site. The original agreement had been signed in 1990, but was now in trouble because the site was missing cleanup milestones and there was general dissatisfaction with the lack of actual cleanup progress. Many studies had been completed, but little actual cleanup work had been done.

One of the Board's first recommendations on the cleanup agreement was a set of community values that should be incorporated. During the next several years as the agreement was slowly negotiated, the Board offered several additional recommendations. The Board's main concern was that the agreement be as universal as possible and cover all activities necessary to clean and close the site. In the end, although some of the smaller details recommended by the Board were not accepted, the final agreement did meet the Board's approval by its universal scope addressing the full range of site cleanup activities. A significant area not meeting the Board's approval was the establishment of soil cleanup levels as discussed below.

Establishing Acceptable Soil Cleanup Levels for Rocky Flats

When the revised Rocky Flats Cleanup Agreement (RFCA) was finalized in 1996, the Board and the community as a whole were shocked by the soil cleanup levels proposed. Specifically, the cleanup level for plutonium, established at 651 picocuries per gram, was most disturbing.

The Board's reaction to the cleanup standards was to recommend that the Department of Energy have an independent entity, such as the National Academy of Sciences, review the soil cleanup levels. The Department rejected this idea, but then began negotiations with the community to develop a locally managed independent assessment. The result of these negotiations was the creation of a community oversight panel to oversee the assessment. The Department of Energy provid-

Independent Reviews

Because of the complex and technical issues involved in cleaning up a contaminated site like Rocky Flats, the Board often hired its own independent experts for assistance. These experts reviewed documents and provided comments to the Board. These reviews and comments often became the foundation of Board recommendations to the Department of Energy.

One noteworthy effort was an independent review of the environmental monitoring program conducted in 1995. Because the cleanup program was just getting underway, the Board and others in the community were concerned about the protectiveness of the environmental monitoring program. While Rocky Flats officials assured the community that the monitoring program was effective, the Board felt it needed to get an outside opinion. The Board hired a consultant who reviewed the monitoring program and provided it with recommendations for enhancement. The bottom line from the review was that indeed the monitoring program was protective, but that a greater effort could be done to communicate and explain monitoring results to the community. Based on the advice of its consultant, the Board developed a set of recommendations on how to improve communications, many of which were later implemented at Rocky Flats.

ed the funding. Because it already had a grant in place with the Department of Energy, the Citizens Advisory Board served as the contract manager for the project and handled all of the financial matters. The oversight panel developed a scope of work for the assessment and then hired its own contractor. The independent assessment took eighteen months and resulted in a recommendation to lower the soil cleanup level for plutonium to 35 picocuries per gram.

Neither the Department of Energy (DOE) nor the regulatory agencies accepted this revised number and instead began another round of reassessment of the cleanup levels. DOE and the agencies established a community focus group on which members of the Citizens Advisory Board participated. After another two years of discussion, DOE and the agencies established a final soil cleanup standard for plutonium set at 50 picocuries per gram.

A large earthen cap was constructed over the Present Landfill at Rocky Flats.

This lower cleanup standard involved a trade-off, however. Whereas the original 1996 soil cleanup applied to all soil regardless of depth, the revised 50 picocurie level would apply only to surface soil. For areas deeper than 6 feet, substantially larger amounts of contamination -- up to 7,000 picocuries -- could remain provided no exposure pathway existed. DOE explained that the trade-off was necessary because cleanup funding for the site had already been approved based on the previous number. More surface soil cleanup would cost more money, so less cleanup was proposed for deeper soils to make up the difference.

In its comments on these final cleanup levels and the trade-off proposal, the Board was appreciative that more contamination would be removed from the surface, but expressed its dissatisfaction with the subsurface trade-off. Despite the Board's objections, the revised cleanup levels were implemented. Fortunately, the amount of subsurface soil contamination turned out to be far less than originally thought. For those areas in which it remains, the Department of Energy will need to maintain controls so that activities such as digging, well-drilling and other soil disturbing activities will not take place in the future.

The Acceleration of Rocky Flats Cleanup

Soon after the Board began operation, a Department of Energy report stated that the cleanup could take up to 70 years at a projected cost of $23 billion. This estimate was based on doing business as usual. If a new cleanup approach could be developed, perhaps the costs and schedule could be reduced.

One of the first ways the Department of Energy chose to address this issue was to seek a new contractor for Rocky Flats. In the past, its contractors were reimbursed for their costs, plus they earned a percentage fee. DOE decided its new contractor would earn its money only if it met specific performance goals. The better it performed, the more money it could make. In June 1995, the new cleanup contractor, Kaiser-Hill, was hired.

Kaiser-Hill brought with it new ideas. One of the most significant ideas was to develop a new work baseline to clean up and close Rocky Flats. The new approach was based on first addressing the most urgent risks, which included the improperly stored plutonium solutions and other nuclear materials. By addressing these areas first, the site could reduce its major overhead costs associated with safeguarding these materials. The money saved could then be redeployed to accelerate building demolition and environmental remediation.

From these ideas sprang a succession of draft plans that eventually solidified as the *Ten Year Plan*. The goal was for cleanup at Rocky Flats to be complete by the end of 2006 at a substantially reduced cost at $7 billion. The accelerated cleanup approach was formalized in 1997 when then Secretary of Energy Federico Peña designated Rocky Flats as an accelerated closure site. Doing so ensured greater support from Congress and most importantly, a stable source of funding to complete the cleanup.

While it was supportive of more rapid risk reduction and cleanup of the site, the Board was consistent in its concern that speed not compromise safety. Monitoring of the site's safety performance was a major focus for the Board during the ensuing years of cleanup. Whenever major safety infractions occurred or negative safety trends became evident, the Board requested presentations and carefully reviewed reports in order to hold the site accountable. By emphasizing safety, the site was able to complete the cleanup early with no lives lost and only minor worker injuries occurring.

Developing Consistent Cleanup Values and Position Statements

During its thirteen years of operation, the Board developed several consistent positions that it applied as the cleanup of the site progressed. Most of these positions were developed or refined by the Board during a year-long process that culminated with its publication of a report, *A Vision for the Cleanup of Rocky Flats*, in 1999.

Groundwater monitoring wells such as these will continue operation for many years to come.

The first position was to set a goal of cleanup to background levels of contamination when and if technology allows for that to happen. As discussed earlier, the establishment of appropriate cleanup levels for Rocky Flats was a major concern for the Board and the community surrounding the site. Because environmental cleanup standards evolve over time, often in a downward direction, the Board maintained that cleanup to background should be a goal, even as the members realized that current technology would not allow that to happen. The members viewed the established cleanup levels set as being interim in nature and advised that continued research should be conducted to see if one day the cleanup to background goal could be attained. This was one area in which the Board was never able to get agreement from the Department of Energy and the regulators.

Another position for the Board was that no wastes should be permanently disposed at Rocky Flats. In the early days of the cleanup, there was concern that receiver sites for the wastes generated during the cleanup would not be available. In order that the cleanup could proceed, the Board approved recommendations allowing for onsite storage of wastes, as long as they were monitorable and retrievable. Eventually, receiver sites for waste materials were made available and all wastes were shipped from Rocky Flats. The main waste receiver sites included the Waste Isolation Pilot Plant (WIPP) in New Mexico, the Envirocare facility in Utah, and the Nevada Test Site near Las Vegas.

Members of the Board made their "final inspection" of Rocky Flats in May 2006.

The use of explosives for building demolition was a Board concern. The members consistently recommended that explosives not be used on buildings or structures not fully decontaminated. Although plans to use explosives were developed for some of the more contaminated buildings, they were never implemented. Instead, the site chose to use mechanical demolition methods with safeguards such as water sprays for dust suppression and enhanced air monitoring.

In areas with soil contamination, the Board was concerned that cleanup activities could lead to more widespread contamination. For two areas in particular, the Board recommended that the site install temporary tent structures in which to conduct the cleanup. The first of these areas was a waste trench that contained barrels of depleted uranium. The other was the 903 Pad where an asphalt cover had been installed over soil contaminated with plutonium. Although site officials initially dismissed the idea of using tent structures to cover these remediation projects, eventually they decided to use them. Both projects were successfully completed and no further contamination escaped as a result.

Initial cleanup plans for the site called for the use of soil caps to cover large portions of the former Industrial Area. The Board opposed the use of caps, instead preferring that contaminants be removed from these areas. An exception would be the use of caps to cover the two former landfills that predominantly contained sanitary wastes. In the end, only the landfill caps were installed and cleanup within the Industrial Area was complete enough to not require a soil cover.

Storage of tons of weapons grade plutonium close to a large metropolitan area was not an acceptable situation for the Board. As such, the members supported the complete and timely removal of plutonium from the site. Identifying a receiver site was a major concern, however. Early on, the Board supported the construction of a more robust, temporary storage vault at Rocky Flats in order to ensure that while plutonium remained at the site it would be as safe as possible. Such construction was not needed, however, as plans eventually were approved to send the bulk of the plutonium from Rocky Flats to the Savannah River Site in South Carolina. The final plutonium shipment left Rocky Flats in 2003.

Land Use Decisions

When the Board was originally formed, another community effort was already underway to provide recommendations on the future use of Rocky Flats. The Future Site Use Working Group headed up this effort and was comprised of a broad cross-section of community interests. The Group eventually issued a report calling for the majority of the site to be preserved as open space with limited industrial reuse to occur in the main industrial portion. The Board reviewed this report and endorsed these recommendations.

As the cleanup of Rocky Flats progressed, it became more apparent that there was little interest within the business community to reuse facilities at Rocky Flats. Thus, the Department of Energy decided to remove all site buildings and infrastructure. Talk now turned toward keeping the entire site as open space after cleanup. The Board favored this idea as long as the site remained in federal control.

In 1999, area congressional representatives began floating proposals to create either permanent open space or a wildlife refuge at Rocky Flats. Both proposals called for leaving the site in federal control, which was the Board's favored position. The Board also expressed concern that the land use decisions not dictate the cleanup at the site. In 2001, Congress approved the Rocky Flats National Wildlife Refuge Act allowing for the establishment of a wildlife refuge after the cleanup at Rocky Flats was complete.

Long-Term Stewardship after Cleanup

Because the Board knew that cleanup at Rocky Flats would leave behind residual amounts of contamination, the members spent considerable time discussing and preparing recommendations associated with long-term stewardship at the site. The members also participated for several years in a joint stewardship discussion group with the Rocky Flats Coalition of Local Governments. As a result of these discussions, the Board and the Coalition jointly published two reports on long-term stewardship issues.

Some important issues related to stewardship that the Board consistently raised included foremost that stewardship planning needed to be incorporated into cleanup decision-making. The Board also wanted to see layering of controls so

National Activities

The Rocky Flats Citizens Advisory Board was part of a larger national organization known as the Environmental Management Site Specific Advisory Board (EM SSAB). At least twice a year, the Chairs and other representatives from each of the local boards making up the EM SSAB met in national meetings to discuss issues of common concern and to draft recommendations to the Department of Energy. Besides the meetings, the EM SSAB also sponsored national workshops that focused on a specific area of common interest. Topics discussed at these workshops included nuclear waste management issues such as transportation and disposal, long-term stewardship, and groundwater contamination remediation.

Several of these national meetings were sponsored and organized by the Rocky Flats Citizens Advisory Board. These included two of the Chairs' meetings, as well as a workshop focused on long-term stewardship needs following the cleanup of contaminated sites.

that if one were to fail, another would still be in place. The Board also recommended that fences and signs be installed to delineate the boundaries of land to be retained by the Department of Energy and land that would become a wildlife refuge.

VI. What Remains at Rocky Flats?

As acknowledged previously, the cleanup at Rocky Flats did not involve returning the site to a pristine state. Still, the cleanup is one that most Board members support as long as stewardship controls remain in place.

Groundwater at Rocky Flats will need continued treatment and monitoring for a considerable amount of time. During cleanup, there was an emphasis on removing the sources of groundwater contamination so that the problem will not get worse over time. Treatment systems are in place and will require periodic maintenance to remain effective. The groundwater contaminants include organic solvents, uranium and nitrates. Historically, plutonium has not been a groundwater contamination problem at the site.

Surface soils have been cleaned up to meet the 50 picocurie standard for plutonium. Contamination at this level presents a risk to a wildlife refuge worker of developing cancer at 1 in 100,000. Federal cleanup rules under Superfund allow for an acceptable risk range of between 1 in 10,000 and 1 in a million. The Rocky Flats cleanup is in the middle of this range.

As described earlier, a different cleanup standard was developed for subsurface soils. It is fortunate that early fears of finding extreme amounts of subsurface contamination were not realized. There are building foundations with small amounts of plutonium contamination that have been left in place and are at least three feet below the surface, but most are much deeper. There are underground pipes that ran between buildings carrying liquid materials that were left in place, although they have been grouted and sealed. As a precaution, prohibitions against soil disturbances in these areas will need to be enacted and enforced.

The two landfills at the site were stabilized with soil covers and drainage systems were installed. These landfills will require monitoring to make sure the covers remain in good condition. Groundwater conditions in the areas downstream of the landfills will require monitoring.

To help ensure public confidence in the cleanup, the Department of Energy agreed to fund an independent validation and verification (IVV) process. The Oak Ridge Institute for Science and Education (ORISE) performed the IVV, which included the collection of soil samples to confirm that cleanup levels had been achieved. Some of the soil samples collected by ORISE revealed hot spots of contamination near the former 903 Pad that were missed during the initial cleanup. These hot spots were removed.

A separate helicopter flyover of the site also was done. The helicopter carried a radiation detector device over the entire site. The helicopter survey did not detect any previously unknown areas of contamination at the site.

As a lesson learned from the IVV process, the Board would recommend that a rig-

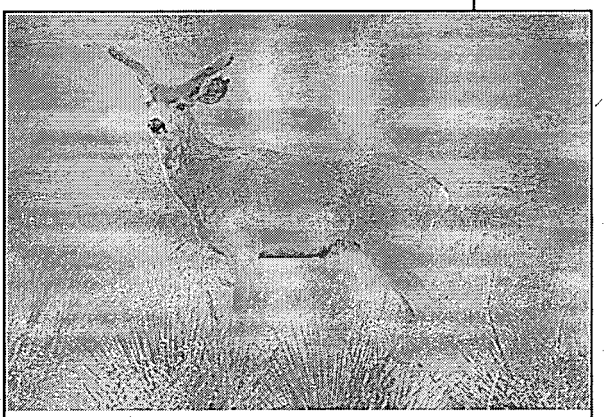
orous cleanup validation and verification process needs to be planned and approved before any cleanup work is done. In the Board's view, the IVV process used at Rocky Flats was pieced together at the end of cleanup. It should have been more carefully thought out as part of the initial cleanup strategy planning.

VII. The Future at Rocky Flats

On October 13, 2005, the site contractor declared cleanup as complete. With the cleanup done, Rocky Flats now enters a new era in its history.

Because there is some residual contamination in the central industrial core of the site, the Department of Energy will retain control over these lands. A newly created organization within DOE, the Office of Legacy Management, will have oversight responsibility. Legacy Management will maintain and monitor the groundwater collection and treatment systems as well as the caps at the two former landfills. It also will be responsible for monitoring surface water and for maintaining vast areas of revegetated soil.

The majority of the site will become a national wildlife refuge managed by the U.S. Fish and Wildlife Service. The United States Congress officially created the Rocky Flats National Wildlife Refuge by special legislation in 2001. The legislation specified that the refuge would be established only upon certification of the cleanup by the Environmental Protection Agency. This certification is expected sometime in 2007. In 2004, Fish and Wildlife released its Comprehensive Conservation Plan outlining how it will manage the refuge. The Plan calls for extensive ecological restoration at the site with some public access. Future public activities will include hiking, biking, and horseback riding along designated trails. There also will be limited hunting allowed in special programs for youth and the disabled. For the first five years, Fish and Wildlife plans to do mostly ecological restoration. One public trail may be opened during that time, but most public access will be limited for the first five years.



Deer have always been found at Rocky Flats. For the first time in 50 years, they now outnumber humans at the site.

VIII. Future Public Participation

Future public participation at Rocky Flats will be focused through a new organization called the Rocky Flats Stewardship Council. Authority and funding to establish the Council was provided to the area local governments through federal legislation in 2004. The Council was created by the now defunct Rocky Flats Coalition of Local Governments and began operation in March 2006. Current membership on the Council includes representatives from eight local governments surrounding Rocky Flats. Four other persons were chosen by the local governments to join. They include one community member and one representative each from the League of Women Voters, the Rocky Flats

Homesteaders (a group of former Rocky Flats workers), and the Rocky Flats Cold War Museum. The museum is a separate non-profit group that hopes to someday open an historical and educational facility on land near Rocky Flats.

Formation of the Rocky Flats Stewardship Council was a large disappointment for the Board, primarily due to the limited representation by individuals and organizations outside of the area local governments. While it does not deny the important role of local governments, the Board believes that the process used to establish the Council and its ultimate make-up should have been more inclusive of the much broader community. A major concern is that important institutional knowledge will be lost over time as term-limited elected officials come and go.

The Office of Legacy Management intends to hold quarterly and annual public meetings for at least the next few years. At these meetings, information about the site and the effectiveness of the cleanup activities will be shared with the community. Legacy Management also will provide extensive information on its website. Currently, this site can be found at: www.lm.doe.gov/land/sites/co/rocky_flats/rocky.htm.

IX. Lessons Learned

After reflecting on its activities over the past thirteen years, the Board offers the following lessons learned that contributed to its success in overseeing the cleanup at Rocky Flats.

- Early participation in reviewing cleanup plans and documents was very useful. Often times, the Board was offered preliminary drafts that allowed it ample time to learn about the issues and develop its recommendations.

- Participation by the *ex officio* representatives was very important. Having direct input by representatives from the Department of Energy and the regulators proved invaluable as the Board was able to gauge their initial reactions to its advice and recommendations.

- The open door policies of the Department of Energy, the site cleanup contractor and the regulators allowed Board representatives to meet with these agencies and gather information on an informal basis.

- Having financial resources to hire its own experts provided the Board with access to independent views and opinions that were extremely valuable to its deliberations and development of recommendations. In this manner, the Board was able to offer informed advice backed by the opinions of its own experts.

- Being able to tour the site and visit many of the buildings and facilities provided the Board a firsthand look at the numerous cleanup challenges. Despite the security challenges, especially when plutonium was still present at the site, site representatives were very open to allowing the Board to visit.

X. Recommendations for the Future

For those who will continue to monitor the Rocky Flats site into the future, the Board offers these final recommendations it believes are important.

- Water quality will be a significant measure of the site's cleanup. Historically, water quality problems have occurred at Rocky Flats during periods of increased precipitation and run-off. Although sur-

face water quality as its leaves the site has always remained below regulatory limits, there have been some instances, as recent as 2005, where onsite water quality has exceeded state standards for plutonium, uranium, and americium. This water is collected in onsite ponds and tested before it is released to streams that travel offsite. Hopefully, the cleanup activities and the extensive revegetation program will help to address the past water quality problems. The Board advises that site neighbors and other interested community members pay particular attention to the surface water monitoring program for the foreseeable future.

- Because there is some residual contamination left at the site, it is very important that the Department of Energy develop readily accessible and easy-to-understand information that describes this contamination and explains its risk. Although this information can be found in the thousands of pages of written information documenting the cleanup, the Board believes it needs to be condensed and presented in a better manner. The information should provide simple maps, diagrams and other graphic materials that show where contamination exists. It also is important that this information include an easily understood description of the inherent risk.

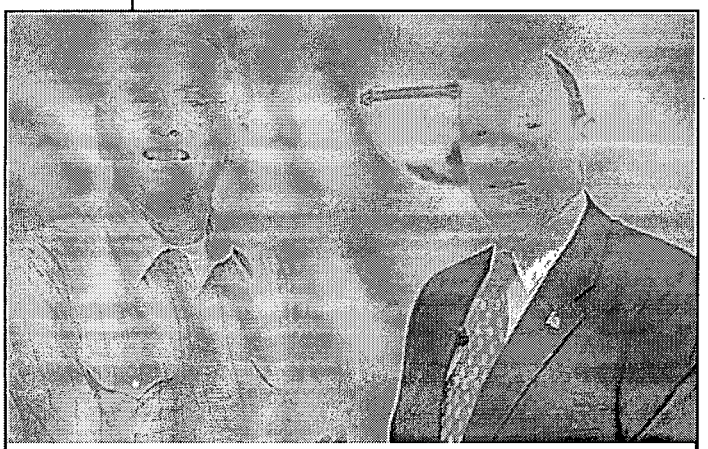
- While general public interest in Rocky Flats is likely to diminish over time now that the cleanup is complete, community members still need to be provided opportunities to receive information and ask questions. Are the cleanup remedies such as the landfill caps and the groundwater treatment units functioning as intended? Are water quality standards being met? These and other questions must remain a part of the community's interest in the site. To facilitate continued public involvement, future public meetings must be accessible in both time and location. Meetings must be held in the evening or on weekends so that working individuals can attend. There must be no compromise on this issue; otherwise, the general public will eventually lose its voice on matters related to the site.

XI. Final Reflections

In the opening paragraphs it was stated that this report was about legacies. The legacy of nearly 50 years of operation as a nuclear weapons manufacturing facility left Rocky Flats with serious environmental problems that required a massive cleanup program costing over $7 billion. With the cleanup program complete and the site on its way to becoming a National Wildlife Refuge, it is important that its former mission never be forgotten. No one can be 100% certain that the entire danger of the past has been eliminated from the site. The need to remember the past is an essential Rocky Flats legacy.

Any uncertainty about the site's cleanup can be tempered, however, by reflecting on another legacy. This legacy is the contribution of a group of citizens whose mission it was to learn about the cleanup, offer their comments and recommendations, and track the progress. This level of scrutiny is likely unprecedented for a Superfund site. Not much happened at Rocky Flats during the past thirteen years that escaped the Board's attention. Given the amount of secrecy that surrounded Rocky Flats in its first 40 years of operation, the openness of the cleanup years was an astounding reversal.

The members of the Rocky Flats Citizens Advisory Board are proud of their efforts associated with the cleanup of Rocky Flats. While it only served in an advisory capacity and did not have any true authority over cleanup decision-making, the Board still had an impact. It held the Department of Energy and the regulatory agencies accountable and made them explain and justify their actions. The Board did not always agree with the decisions that were made, but at least the members were informed and involved. The cleanup is better because of these efforts.



Board Chair Gerald DePoorter (left) received the President's Volunteer Service Award from DOE Assistant Secretary James Rispoli in April 2006. Gerald accepted the award on behalf of the entire Board for its many hours of volunteer community service.

The credit for the successful cleanup and closure of Rocky Flats, however, lies mainly with the dedicated workforce. These workers were the ones who accepted and carried out the dangerous task of cleaning up, tearing down, and hauling off this former nuclear weapons facility. It is this legacy for which they and the entire community should be most proud.

XII. Acknowledgements

After thirteen years of operation, there are many individuals that have contributed to the Board's success. Most important are the members themselves who have collectively donated thousands of hours of their time reviewing documents, attending meetings, drafting recommendations and participating in discussions. The Board is extremely grateful to its staff members who have faithfully provided it service over the years. These employees made the Board's efforts so much easier. Appreciation also is due to the U.S. Department of Energy, both at the local and national levels, for providing the financial support necessary to keep the Board in operation. Department of Energy officials, as well as individuals from its contractors at Rocky Flats also supported the Board by attending meeting, giving countless presentations, and helping explain the many technical aspects of the Rocky Flats cleanup. Also contributing have been representatives from the U.S. Environmental Protection Agency, the Colorado Department of Public Health and Environment, the U.S. Fish and Wildlife Service, and the Defense Nuclear Facilities Safety Board. Individuals from these agencies gave their time by attending our meetings and helping us in drafting recommendations. Finally, the Board wishes to acknowledge other community members who have participated in our numerous committees and attended our meetings. The collective participation of all the persons and agencies mentioned above has made the cleanup and closure of the Rocky Flats site a reality. Our deepest thanks to everyone for their contributions.

Board Members and Completed Years of Service

10 Years:	Tom Gallegos
9 Years:	LeRoy Moore
8 Years:	Victor Holm *(Board Chair - 2003, 2004)*, Tom Marshall *(Board Chair - 1997, 1998)*
7 Years:	Eugene DeMayo, Joe Downey, Jim Kinsinger *(Board Chair - 1999)*, Bill Kossack, Mary Mattson
6 Years:	Tom Davidson, David Navarro, Linda Sikkema *(Board Chair - 1995, 1996)*
5 Years:	Alan Aluisi, Jerry DePoorter *(Board Chair - 2000, 2001, 2005, 2006)*, Mary Harlow, Beverly Lyne
4 Years:	Suzanne Allen, Jan Burda, Earl Gunia, Gary Thompson
3 Years:	Tom Clark, Ralph Coleman, Jeff Eggleston *(Board Chair - 2002)*, Shirley Garcia, Kathryn Johnson, Jack Kraushaar, Andrew Ross, Bryan Taylor
2 Years:	Susan Barron, Ray Betts, Shawn Burke, Lloyd Casey, Chuck Clark, Maureen Eldredge, Erin Hamby, Susan Johnson, Bob Kanick, Mike Maus, Bill McNeill, Nancy Peters, Markuene Sumler, Phil Tomlinson
1 Year:	Lorraine Anderson, Stuart Asay, Bruce Belleville, Gale Biggs, Jim Burch, Robin Byrnes, Dave Davia, Gislinde Engelmann, Jim Fabian, Anne Fenerty, Paul Grogger, Sasa Jovic, Mike Keating, Albert Lambert, Richard Seebass, Earl Sorrels, Hank Stovall, Joe Tempel, Reginald Thomas
<1 Year:	Jeff Allen, Carol Barker, Meir Carasso, Bruce Dahm, Derek Dye, Mike Freeman, Noelle Green, Kip Harward, Henrietta Jonas, Paul Jurasin, Jason Krupar, Alliyah Mirza, Eric Morris, Carol O'Dowd *(Interim Board Chair - 1993, 1994)*, Bill Petersen, Sean Rea, Vanessa Safonovs, Todd Saliman, Kathy Schnoor, Conrad Stoldt, Lesley Taufer, Curtis Watts

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12 Years:	Ken Korkia
9 Years:	Deborah French
6 Years:	Erin Rogers
4 Years:	Patricia Rice
3 Years:	Jerry Henderson
2 Years:	Brady Wilson
1 Year:	Noelle Stenger Green, Lisa Hanson
<1 Year:	Michelle Kump, Chris Millsaps, Susan Wilds

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